

ABDOMEN

CHAPTER 50

Inspection of the Abdomen

KEY TEACHING POINTS

- Grey Turner and Cullen signs are important clues to retroperitoneal or intra-abdominal hemorrhage from a variety of causes.
- Sister Mary Joseph nodule is metastatic carcinoma of the umbilicus, usually adenocarcinoma from the stomach, large bowel, ovary, or pancreas. For many patients the nodule is the first sign of malignancy.

This chapter reviews two physical signs, ecchymosis of the abdominal wall and Sister Mary Joseph nodule. Other chapters discuss jaundice ([Chapter 8](#)), dilated abdominal veins ([Chapter 8](#)), signs of malnutrition ([Chapter 12](#)), and abnormal respiratory movements of the abdominal wall ([Chapter 19](#)).

ECCHYMOSIS OF THE ABDOMINAL WALL

I. THE FINDINGS

Ecchymosis of the abdominal wall is an important sign of retroperitoneal or intraperitoneal hemorrhage. Periumbilical ecchymosis is called the **Cullen sign**, after the American pathologist and clinician who first described the finding in a patient with ectopic pregnancy in 1918.* Flank ecchymosis is often called **Grey Turner sign** or **Turner sign**, after the British surgeon Gilbert Grey Turner who described the sign in a patient with hemorrhagic pancreatitis in 1920.³ Nonetheless, Cullen and Turner signs are rare, occurring in less than

*Cullen was well versed in the anatomy of the umbilicus, having just 2 years before his report published the book *Embryology, Anatomy, and Diseases of the Umbilicus, Together With the Urachus*, which contained 27 chapters on the umbilicus.^{1,2}

1% of patients with ruptured ectopic pregnancy⁴ and less than 3% of patients with pancreatitis.⁵ Both signs have since been described in a wide variety of other disorders, including intrahepatic hemorrhage from tumor,⁶ amebic liver abscess,⁷ ischemic bowel,⁸ splenic rupture,⁹ rectus sheath hematoma,¹⁰ perforated duodenal ulcer,¹¹ ruptured abdominal aortic aneurysm,¹² percutaneous liver biopsy,¹³ and coronary angiography.¹⁴ Sometimes, the same patient will have both Cullen and Grey Turner signs.^{15,16}

II. PATHOGENESIS

The discoloration of the skin is actually due to the collection of blood in the subcutaneous fascial planes, not the dispersion of red cells within lymphatics, as has been sometimes surmised.¹⁷ In patients with pancreatitis, computed tomography often reveals collections of retroperitoneal blood within the fascial planes behind the kidney, which may then pass to the subcutaneous tissues of the lateral abdominal wall via the lateral border of the quadratus lumborum muscle.¹⁸ Presumably, the mechanism of the Grey Turner sign in other disorders is the same. In most patients with the Cullen sign, blood travels to the periumbilical area through the falciform ligament, which connects to the retroperitoneum via the lesser omentum and transverse mesocolon (the falciform ligament and lesser omentum are the embryologic remnants of the ventral mesentery, into which the liver has grown).

However, in patients with ectopic pregnancy the falciform ligament is probably not responsible for the Cullen sign because the ecchymosis of these patients is often located on the abdominal wall below the umbilicus, yet the falciform ligament attaches to the abdominal wall above the umbilicus. Some investigators have hypothesized that fascial planes connecting the broad ligament and the lower abdominal wall are responsible for the Cullen sign in ectopic pregnancy,¹⁸ although this does not explain why the sign sometimes appears in patients with free rupture into the peritoneal cavity outside of the broad ligament.⁴

SISTER MARY JOSEPH NODULE

I. THE FINDING

Sister Mary Joseph nodule is metastatic carcinoma of the umbilicus. It usually presents as a hard dermal or subcutaneous nodule and, in approximately 20% of patients with the lesion, it represents the initial sign of malignancy.¹⁹ Most patients have metastatic adenocarcinoma, usually from the stomach, large bowel, ovary, or pancreas (usually the tail of the pancreas, not the head).¹⁹⁻²⁴ It is an ominous sign, the average survival after discovery being only 10 to 11 months.^{19,22}

The finding is named after Sister Mary Joseph, who, as first surgical assistant to William J. Mayo, noted the association between umbilical nodules and intra-abdominal malignancy (Sister Mary Joseph was born Julia Dempsey in 1856; before Vatican II in 1965, all Franciscan nuns took the name of Mary as a prefix to an additional name).^{25,26} Dr. Mayo discussed the sign as early as 1928, calling it the **pants-button umbilicus**.²⁷ It was not until Sir Hamilton Bailey's 1949 edition of *Physical Signs in Clinical Surgery* (10 years after Sister Mary Joseph's death) that the term **Sister Mary Joseph nodule** was used.²⁸ A mimic of the Sister Mary Joseph

nodule is an omphalith, which is the hardened concretion of keratin and sebum in the umbilicus from inadequate hygiene.²⁹ However, careful examination of these patients manages to extract the debris.

II. PATHOGENESIS

There are many potential avenues of spread to the umbilicus: vascular and lymphatic connections to the retroperitoneum, axilla, and inguinal regions, and embryological remnants that connect the umbilicus to the bladder and retroperitoneum.³⁰ Nonetheless, the umbilicus and periumbilical tissues represent the thinnest part of the abdominal wall, and in one series of patients, direct spread from peritoneal tumor implants through the abdominal wall was the most common cause of the umbilical nodule.¹⁹

The references for this chapter can be found on www.expertconsult.com.

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REFERENCES

1. Young RH. History of gynecological pathology. I. Dr. Thomas S. Cullen. *Int J Gynecol Pathol.* 1996;15(2):181–186.
2. Cullen TS. *Embryology, Anatomy, and Diseases of the Umbilicus, Together With the Urachus.* Philadelphia, PA: W. B. Saunders; 1916.
3. Turner GG. Local discoloration of the abdominal wall as a sign of acute pancreatitis. *Br J Surg.* 1920;7:394–395.
4. Merrill JA. Cullen's sign: a historical review and report of histologic observations. *Obstet Gynecol.* 1958;12(3):317–324.
5. Dickson AP, Imrie CW. The incidence and prognosis of body wall ecchymosis in acute pancreatitis. *Surg Gynecol Obstet.* 1984;159:343–347.
6. Marinella MA. Cullen's sign associated with metastatic thyroid cancer. *N Engl J Med.* 1999;340(2):149–150.
7. Misra A, Agrahari D, Gupta R. Cullen's sign in amoebic liver abscess. *Postgrad Med J.* 2002;78:427–428.
8. Kelley ML. Discolorations of flanks and abdominal wall. *Arch Intern Med.* 1961;108:132–135.
9. Chung MA, Oung C, Szilagyi A. Cullen's sign: it doesn't always mean hemorrhagic pancreatitis. *Am J Gastroenterol.* 1992;87(8):1026–1028.
10. Harris S, Naina HVK. Cullen's sign revisited. *Am J Med.* 2008;121(8):682–683.
11. Evans DM. Cullen's sign in perforated duodenal ulcer. *Br Med J.* 1971;1:154.
12. Armour RH, Clifton MA, Marsh CH. Balloon catheter control of a ruptured abdominal aortic aneurysm in a patient with Cullen's sign. *Br J Surg.* 1978;65:350.
13. Capron JP, Chivrac D, Delamarre J, Dupas JL, Lorrizux A. Cullen's sign after percutaneous liver biopsy. *Gastroenterol.* 1977;73:1185–1191.
14. Spence MS, Webb SW. Cullen's sign after coronary angiography. *Heart.* 2000;83(6):640.
15. Bosmann M, Schreiner O, Galle PR. Coexistence of Cullen's and Grey Turner's signs in acute pancreatitis. *Am J Med.* 2009;122(4):333–334.
16. Bonani M, Franzen D, Anabitarte P. Images in emergency medicine. Cullen's sign and Grey-Turner's sign. *Ann Emerg Med.* 2008;51(4):448–458.
17. Bem J, Bradley EL. Subcutaneous manifestations of severe acute pancreatitis. *Pancreas.* 1998;16(4):551–555.
18. Meyers MA, Feldberg MAM, Oliphant M. Grey Turner's sign and Cullen's sign in acute pancreatitis. *Gastrointest Radiol.* 1989;14:31–37.
19. Powell FC, Cooper AJ, Massa MC, Goellner JR, Su WPD. Sister Mary Joseph's nodule: a clinical and histologic study. *J Am Acad Dermatol.* 1984;10:610–615.
20. Galvan VG. Sister Mary Joseph's nodule. *Ann Intern Med.* 1998;128(5):410.
21. Yendluri V, Centeno B, Springett GM. Pancreatic cancer presenting as a Sister Mary Joseph's nodule: case report and update of the literature. *Pancreas.* 2007;34(1):161–164.
22. Dubreuil A, Domp Martin A, Barjot P, Louvet S, Leroy D. Umbilical metastasis or Sister Mary Joseph's nodule. *Int J Dermatol.* 1998;37:7–13.
23. Schiffer JT, Park C, Jefferson BK. Cases from the Osler Medical Service at Johns Hopkins University. Sister Mary Joseph nodule. *Am J Med.* 2003;114(1):68–70.
24. Chalya PL, Mabula JB, Rambau PF, Mchembe MD. Sister Mary Joseph's nodule at a university teaching hospital in northwestern Tanzania: a retrospective review of 34 cases. *World J Surg Oncol.* 2013;11:151.
25. O'Neill TW, O'Brien AAJ. Sister (?Mary) Joseph's nodule. *Ir Med J.* 1987;80:296.
26. Steensma DP. Sister (Mary) Joseph's nodule. *Ann Intern Med.* 2000;133(3):237.
27. Key JD, Shephard DAE, Walters W. Sister Mary Joseph's nodule and its relationship to diagnosis of carcinoma of the umbilicus. *Minn Med.* 1976;59:561–566.
28. Bailey H. *Demonstrations of Physical Signs in Clinical Surgery.* 11th ed. Baltimore, MD: Williams and Wilkins; 1949.
29. Amaro R, Goldstein JA, Cely CM, Rogers AI. Pseudo Sister Mary Joseph's nodule. *Am J Gastroenterol.* 1999;94(7):1949–1950.
30. Coll DM, Meyer JM, Mader M, Smith RC. Imaging appearances of Sister Mary Joseph's nodule. *Br J Radiol.* 1999;72:1230–1233.